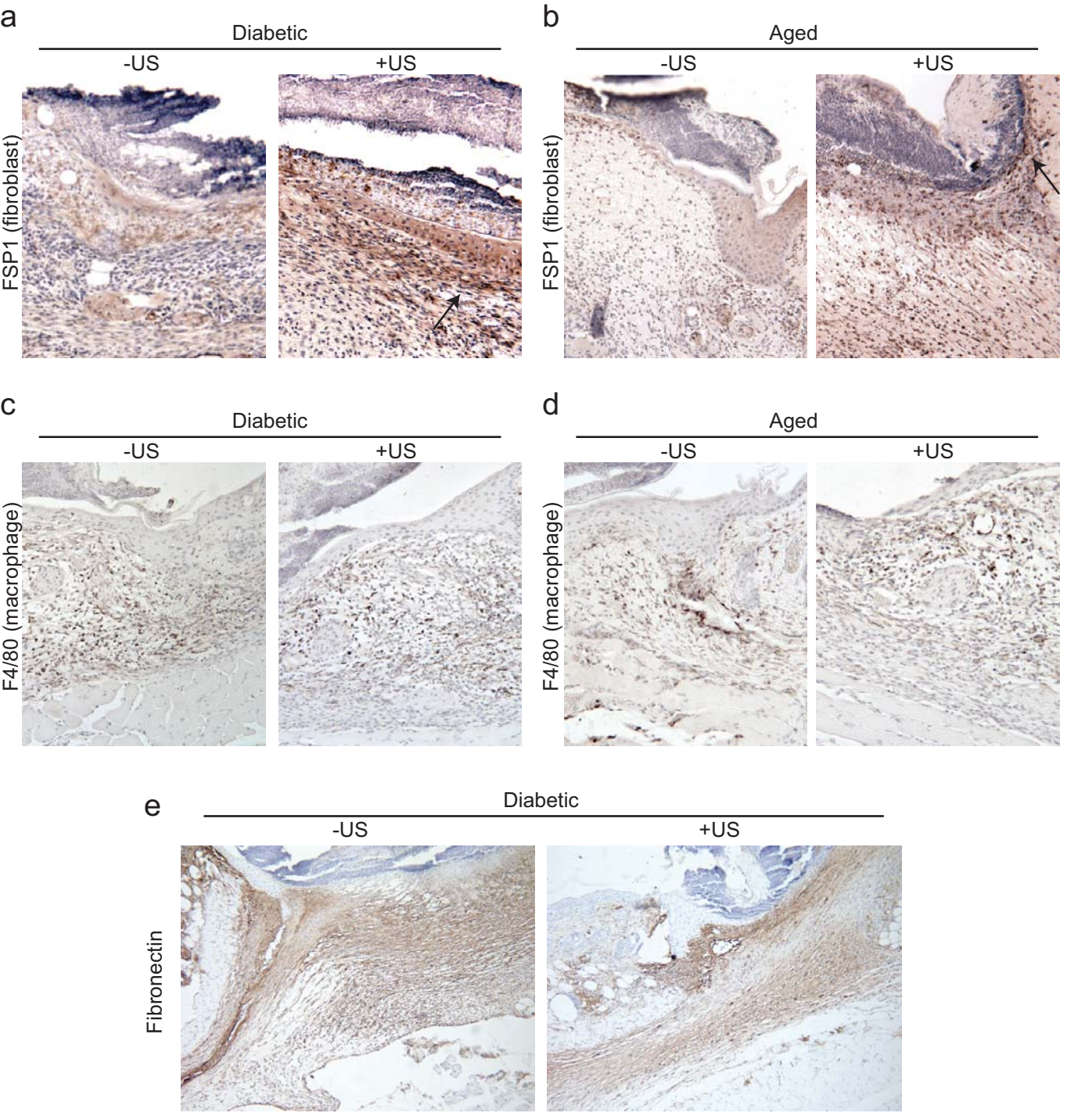

Fig. S1: Rescue of defective healing in diabetic and aged mice. 4-mm full-thickness punch wounds on Diabetic (NOD) (A+B) and 18-month old (C+D) mice were subjected to daily ultrasound or sham treatments. Skin sections were prepared at 72 hours post-wounding and stained for fibroblast-specific protein (FSP) (A+C) or macrophages (F4/80) (B+D). Positively stained fibroblasts and macrophages in brown with haematoxylin counterstain in blue. Quantification of cell number shown in Fig.1G-J. Data are representative of 6 fields of view from each of 4 wounds per condition.

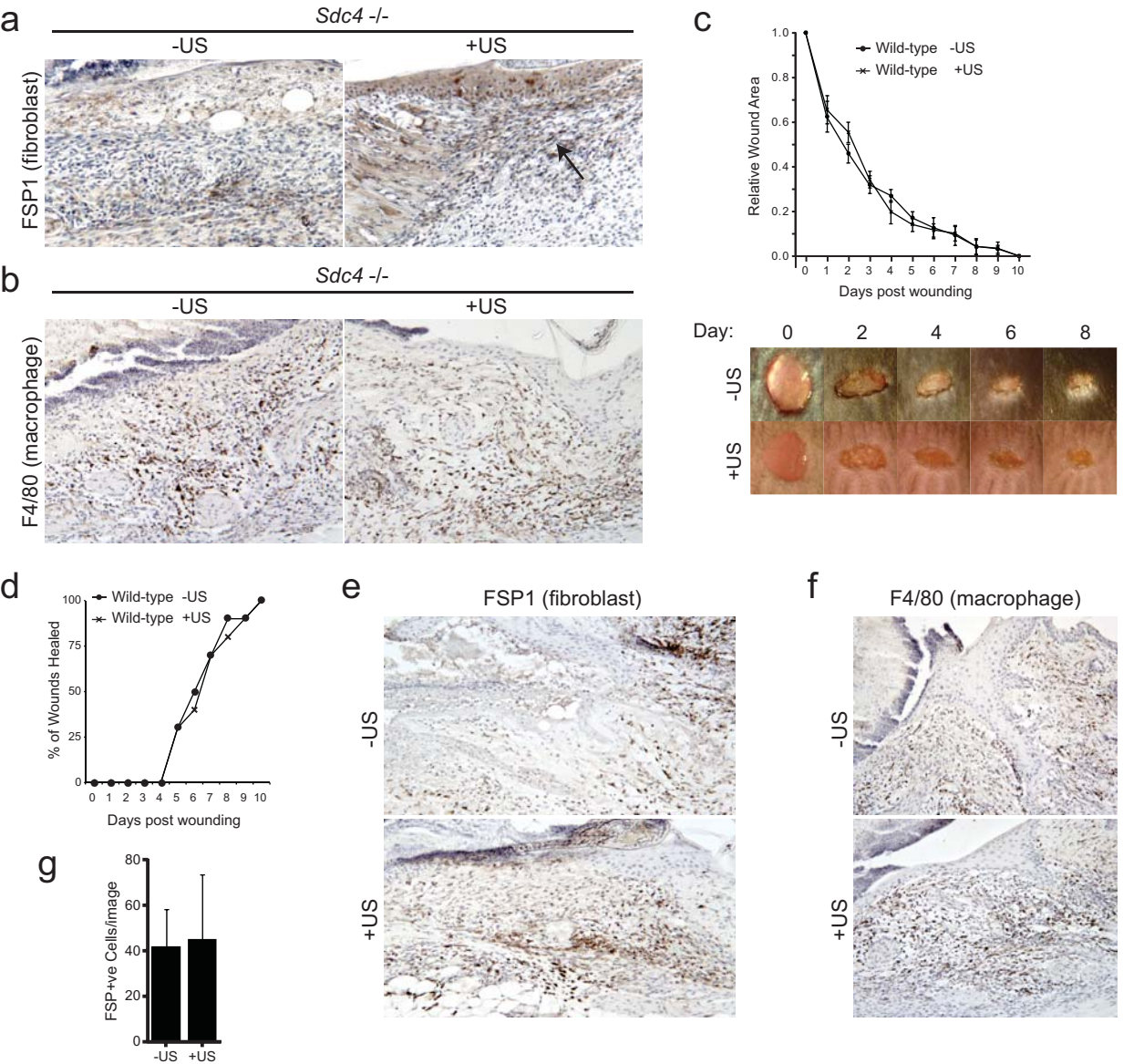

Fig. S2: Effect of ultrasound on syndecan-4-knockout and wild-type mice. 4-mm full-thickness punch wounds on Sdc4 -/- (A-B) or wild-type (C-G) mice were subjected to daily ultrasound or sham treatments and wound closure was recorded. Skin sections were prepared at 72 hours post-wounding and stained for fibroblast-specific protein (FSP) (A+E) or macrophages (F4/80) (B+F). Positively stained fibroblasts and macrophages in brown with haematoxylin counterstain in blue. (C) Daily macroscopic images and measurements of wound area were acquired until the wound was healed. (D) Animals scored for loss of the scab as an indicator of wound resolution. (G) Quantification of panel (E), number of fibroblasts in the wound bed of wild-type mice. Quantification of panel (A) is shown in Fig. 1N. Data are representative of 12 wounds in 6 mice per condition. Error bars indicate s.e.m. Significance tested by Students T-test, *=p<0.05, **=p<0.005.

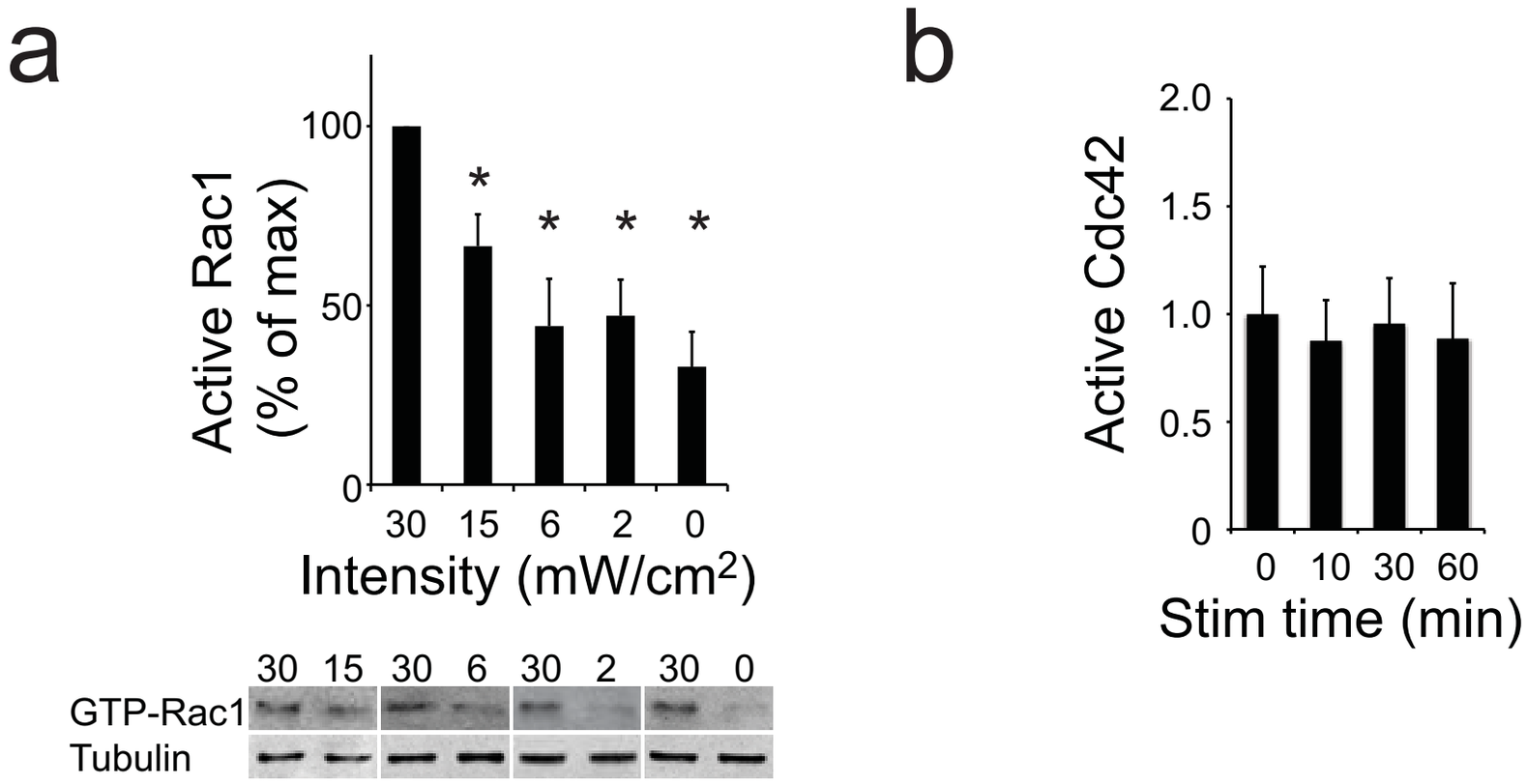

Fig. S3: Cdc42 is not activated by ultrasonic stimulation. MEFs were spread on the integrin-binding fragment of fibronectin, stimulated with ultrasound and analyzed at the appropriate time from the start of stimulation. (A) Rac1 activity measured by effector pull-down assay at 30 minutes after the start of stimulation with ultrasound at intensities of 30, 15, 6, 2 and 0 mW/cm2. (B) Cdc42 activity measured by effector pull-down assay. Error bars indicate s.e.m., n=4 per condition. Significance tested by paired T-test, comparing 15, 6, 2 and 0 mW/cm2 to maximum intensity (30 mW/cm2), *=$p<0.05$.

Movie S1: Ultrasound restores persistent migration to syndecan-4-knockout MEFs. Sham or ultrasound-treated wild-type or *Sdc4* -/- MEFs were seeded onto fibrous cell derived matrix and migration tracked over 16 hours at 6 frames per hour.

Movie S2: Ultrasound restores persistent migration to venous leg ulcer fibroblasts. Sham or ultrasound-treated fibroblasts isolated from human venous leg ulcers were seeded onto fibrous cell derived matrix and migration tracked over 16 hours at 6 frames per hour.